

# Lecture: Working Capital

Effi Benmelech

Kellogg School of Management

# Discussion Agenda

- Define and compute working capital
- Understand the role of working capital as a source of short-term financing
- Understand the Cash Conversion Cycle
- Understand patterns of Cash Conversion Cycle across selected industries

- Net Working Capital is the money available for the company for its short-term operations.
- $NWC = \text{Current Assets} - \text{Current Liabilities}$ 
  - **Current assets** (or short-term assets) include cash, account receivables and inventory.
  - **Current liabilities** (or short-term liabilities) include accounts payable, accrued expenses and short-term debt.
- In the balance-sheet we try to do maturity matching.
  - Short-term (or current) assets are financed with short-term (or current) liabilities.
  - Long term assets are financed with long-term liabilities.

# Example: Macy's 2020

Macy's Inc.

Summary Balance Sheet as of 1/31/2020 (all numbers in thousands)

## Assets

Cash and Cash Equivalents	685,000
Net Receivables	409,000
Inventory	5,188,000
Other Current Assets	528,000

**Total Current Assets** 6,810,000

Net PPE	9,301,000
Goodwill	3,908,000
Intangible Assets	1,081,000
Other long-term Assets	72,000
Total non-current Assets	14,362,000

**Total Assets** 21,172,000

## Liabilities

Current Debt	533,000
Accounts Payable	2,659,000
Taxes Payable	81,000
Accrued Liabilities	590,000
Deferred Revenues	839,000

**Total Current Liabilities** 5,750,000

Long Term Debt	3,621,000
Deferred Taxes	1,169,000
Other Long-term Liabilities	1,337,000

**Total non-current Liabilities** 9,045,000

**Total Liabilities** 14,795,000

**Total Stockholders equity** 6,377,000

**Total Liabilities and Stockholders equity** 21,172,000

# Example: Macy's 2020 - cont'd

- Macy's NWC is:  $\$6,810,000 - \$5,750,000 = \$1,060,000$ .

Macy's Inc.

Summary Balance Sheet as of 1/31/2020 (all numbers in thousands)

Assets		Liabilities	
Cash and Cash Equivalents	685,000	Current Debt	533,000
Net Receivables	409,000	Accounts Payable	2,659,000
Inventory	5,188,000	Taxes Payable	81,000
Other Current Assets	528,000	Accrued Liabilities	590,000
		Deferred Revenues	839,000
<b>Total Current Assets</b>	<b>6,810,000</b>	<b>Total Current Liabilities</b>	<b>5,750,000</b>
Net PPE	9,301,000	Long Term Debt	3,621,000
Goodwill	3,908,000	Deferred Taxes	1,169,000
Intangible Assets	1,081,000	Other Long-term Liabilities	1,337,000
Other long-term Assets	72,000		
Total non-current Assets	14,362,000	<b>Total non-current Liabilities</b>	<b>9,045,000</b>
		<b>Total Liabilities</b>	<b>14,795,000</b>
		<b>Total Stockholders equity</b>	<b>6,377,000</b>
<b>Total Assets</b>	<b>21,172,000</b>	<b>Total Liabilities and Stockholders equity</b>	<b>21,172,000</b>

# Working Capital at Macy's

- Macy's NWC is:  $\$6,810,000 - \$5,750,000 = \$1,060,000$ .
  - it means that Macy's current assets exceed current liabilities by \$1,060,000.
  - Positive working capital means that if we net current liabilities against current assets we have a surplus.
  - Recall that in the balance-sheet, assets represent "uses" while liabilities are the "sources".
  - We use financing from the liabilities to fund investment in assets.
  - And if we think about Assets and Liabilities Management (ALM) in a maturity-matching framework then current liabilities are used to fund current assets.

# Example: Amazon 2019

- Amazon's NWC is:  $\$96,334,000 - \$87,812,000 = \$8,522,000$ .

Amazon

Summary Balance Sheet as of 12/31/2019 (all numbers in thousands)

Assets		Liabilities	
Cash and Cash Equivalents	36,092,000	Accounts Payable	47,183,000
Other Short Term Investment	18,929,000	Accrued Liabilities	32,439,000
Net Receivables	20,816,000	Deferred Revenues	8,190,000
Inventory	20,497,000		
<b>Total Current Assets</b>	<b>96,334,000</b>	<b>Total Current Liabilities</b>	<b>87,812,000</b>
Net PPE	97,846,000	Long Term Debt	23,414,000
Goodwill	14,754,000	Other Long-term Liabilities	12,171,000
Intangible Assets	4,049,000		
Other long-term Assets	12,265,000		
Total non-current Assets	128,914,000	<b>Total non-current Liabilities</b>	<b>75,376,000</b>
		<b>Total Liabilities</b>	<b>163,188,000</b>
		<b>Total Stockholders equity</b>	<b>62,060,000</b>
<b>Total Assets</b>	<b>225,248,000</b>	<b>Total Liabilities and Stockholders equity</b>	<b>225,248,000</b>

# Amazon vs. Macy's

- Note that while NWC is positive for both **Amazon** and **Macy's** there is a big difference between the two firms:
- We have included Cash and Short-term Investment as part of our working capital. But some firms carry high levels of cash on their balance-sheets. And not all of this cash is needed for operations!
  - **Macy's** has \$685 million in cash - they probably need some of it for their operations.
  - On the other hand, **Amazon** has a lot of excess cash - \$36.1 billion in Cash and another \$18.9 billion in Other Short-term Investment. **Amazon** does not need all of this cash for operations and has excess cash.
- Instead of NWC that includes all items in current assets and current liabilities we will often focus on operating working capital using accounts receivables, inventory and accounts payable.

# Operating Working Capital

- Net operating working capital is a measure of a company's liquidity and refers to the difference between operating current assets and operating current liabilities.
- We will typically define it as: **Inventory**+**AR**-**AP**.
- For Macy's operating working capital is:  
 $\$5,188\text{M} + \$409\text{M} - \$2,659\text{M} = \$2,938$ .
- For Amazon operating working capital is:  
 $\$20,497\text{M} + \$20,816\text{M} - \$47,183\text{M} = (\$5,870)$ .

# Investment in Working Capital

- We tend to associate investment with tangible assets such as Property, Plant and Equipment (PP&E).
- However, many firms - especially in the retail sector - invest heavily in inventory.
- Customers expect both (i) **product variety**, and (ii) **high inventory** which results in large inventories.
- **Macy's** inventory represents **24.5%** of its total assets, for **Amazon**  $\text{inventory}/(\text{total assets})=9\%$ .
- Firms need to finance investment in inventory since holding inventory requires cash.

- Accounts Receivables are also an important **investment** for firms.
- Firms may attract customers by offering terms of payments.
- Trade credit is more common in **B2B** than in **B2C**.
- This is an important form of investment but it leads to lots of AR.
- AR is an asset for the firm - it is a form of investment in customers but it eats a lot of cash and requires financing.

# Financing AR and Inventory with AP

- Accounts Payable (AP) is an important source of financing.
- Look at Amazon: their AP are bigger than their inventories and AR combined!
  - **AP=\$47,183M** while inventory is **\$20,497M** and **AR = \$20,816M.**
- On the other hand, for Macy's AP is roughly half of its inventory.
  - **AP=\$2,659M** while inventory is **\$5,188M.**
- You can use AP to finance AR and inventory but not paying on time is costly!

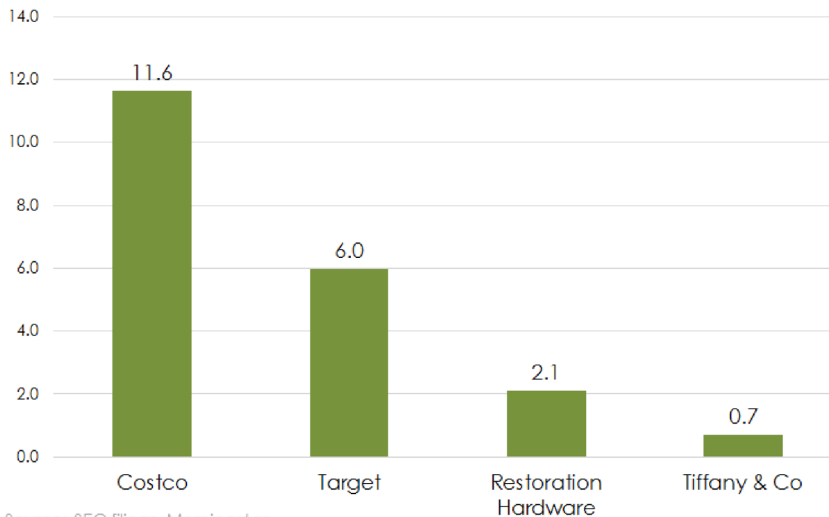
- 2% 10, NET 30: get 2% discount on invoice if paid within 10 days or pay in full in 30 days.
- Attractive to pay within 10 days:
  - Purchase for \$1000 and have the option of paying \$980 in 10 days or \$1000 in 30 days.
  - Equivalent to paying \$20 for the use of \$980 for 20 days.
  - $\$20/\$980=2.04\%$  for 20 days. This can be annualized to 44% with daily compounding.
  - Take trade discounts if you can!
- But Accounts Payable are a source of financing!

$$\frac{\text{COGS}}{\text{Ending inventory}}$$

- Alternative definitions of inventory turnover include sales divided by ending inventory, or COGS divided by average inventory.
- COGS is a more appropriate numerator than sales since sales include a profit markup.

- Inventory turnover measures how often the inventory is sold during a given time period. It is useful in understanding how efficiently a business manages its inventory levels.
- Just as holding more assets for a given level of sales does, holding more inventory for a given level of sales decreases efficiency.
- Although businesses may prefer to hold lower inventory levels, the trade-off is to avoid running out of products available for customers.
- Inventory levels also depend on product characteristics (e.g., perishable products versus packaged goods).

# Inventory Turnover Ratios by Retailer



Source: SEC filings, Morningstar

# Inventory Turnover and Product Quality

- Notice that **Tiffany & Co.'s** low inventory turnover ratio of 0.7 implies a very long DSI - 521 days!. Even a simple diamond engagement ring could come in many combinations of diamond quality, band type and design, and price point.
- **Restoration Hardware** sells high-end home furnishings. A simple armchair on the company's website comes in as many as four styles, five wood finishes, and 45 different leathers! That kind of selection naturally requires substantially more inventory.
- In contrast, **Target** and **Costco** primarily sell food products and home goods. Their product mix of commodity goods gets turned over much faster than specialty furniture or jewelry. Also, a significant share of **Costco** and **Target** goods are perishable which necessitates faster inventory turns.

# Days Sales of Inventory (DSI)

$$\text{Inventory turnover} = \frac{\text{COGS}}{\text{Ending inventory}}$$

- We can modify the inventory turnover by taking its reciprocal and multiplying it by 365.

$$\text{DSI} = \frac{1}{\frac{\text{COGS}}{\text{Ending inventory}}} * 365 = \frac{\text{Ending inventory}}{\text{COGS}/365}$$

- DSI measures the time that it takes a company to turn its inventory into sales. Shorter DSI is better - but it varies across industries.

# Receivables Collection Period

- Also known as Collection Period, Receivables Days or Days Sales Outstanding (DSO).

$$\text{Collection period} = \frac{AR}{Sales/365}$$

- The collection period highlights a company's management of accounts receivables.
- We can think about the collection period as the average time lag between sale and receipt of cash from sales.

## Receivables Collection Period - cont'd

	Urban Outfitters	Gap	Prada	Nordstrom
DSO	7	8	34	61

- Retailers typically do not offer credit to their customers, therefore they do not incur high levels of receivables (**Gap** and **Urban Outfitters**).
- **Nordstrom** has a credit card operation that offers Nordstrom-branded cards to its customers, which retains the receivables on its balance sheet. This accounts for Nordstrom's higher DSO.
- **Prada**, on the other hand, sells not only through its own stores but also through franchises. Therefore, the franchises owe Prada for the products it sells to them for sale to the end customer, as well as possible royalty fees.

- Also known as AP Days or DPO=Days Payable Outstanding.

$$\text{Payable period} = \frac{AP}{COGS/365}$$

- The payable period highlights a company's management of accounts payables.
- We can think about the payable period as the average time it takes the company to pay its suppliers.

## Payable Period- cont'd

	Urban Outfitters	Gap	Prada	Nordstrom
DPO	24	44	119	56

- The difference between **Urban Outfitters'** days payable outstanding of 24 days versus **Prada's** 119 days indicates that Urban Outfitters pays its vendors much faster than Prada does.
- Credit from suppliers serves as a form of short-term financing that can be beneficial if it is cheaper than bank credit or other sources of financing.
- However, an increasing trend in days payable outstanding can suggest that the company has liquidity problems, making it unable to pay its suppliers on time.

# United Airlines' Assets

UNITED AIRLINES HOLDINGS, INC.  
 CONSOLIDATED BALANCE SHEETS  
 (In millions, except shares)

ASSETS	At December 31,	
	2022	2021
Current assets:		
Cash and cash equivalents	\$ 7,166	\$ 18,283
Short-term investments	9,248	123
Restricted cash	45	37
Receivables, less allowance for credit losses (2022—\$11; 2021—\$28)	1,801	1,663
Aircraft fuel, spare parts and supplies, less obsolescence allowance (2022—\$610; 2021—\$546)	1,109	983
Prepaid expenses and other	689	745
Total current assets	20,058	21,834
Operating property and equipment:		
Flight equipment	42,775	39,584
Other property and equipment	9,334	8,764
Purchase deposits for flight equipment	2,820	2,215
Total operating property and equipment	54,929	50,563
Less—Accumulated depreciation and amortization	(20,481)	(18,489)
Total operating property and equipment, net	34,448	32,074
Operating lease right-of-use assets	3,889	4,645
Other assets:		
Goodwill	4,527	4,527
Intangibles, less accumulated amortization (2022—\$1,472; 2021—\$1,544)	2,762	2,803
Restricted cash	210	213
Deferred income taxes	91	659
Investments in affiliates and other, less allowance for credit losses (2022—\$21; 2021—\$622)	1,373	1,420
Total other assets	8,963	9,622
Total assets	\$ 67,358	\$ 68,175

# United Airlines' Assets Structure

- Focus on 2022: total assets: \$67,358M out of which only \$20,058M in current assets - mostly has PP&E (flight equipment).
- No inventory, \$1,109M in aircraft fuel etc. - typical in the service sector (“The Case of the Unidentified Industries”...).

# United Airlines' Liabilities

UNITED AIRLINES HOLDINGS, INC.  
 CONSOLIDATED BALANCE SHEETS  
 (In millions, except shares)

	At December 31,	
	2022	2021
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
Current liabilities:		
Accounts payable	\$ 3,395	\$ 2,562
Accrued salaries and benefits	1,971	2,121
Advance ticket sales	7,555	6,354
Frequent flyer deferred revenue	2,693	2,239
Current maturities of long-term debt	2,911	3,002
Current maturities of other financial liabilities	23	834
Current maturities of operating leases	561	556
Current maturities of finance leases	104	76
Other	779	560
Total current liabilities	19,992	18,304
Long-term debt	28,283	30,361
Long-term obligations under operating leases	4,459	5,152
Long-term obligations under finance leases	115	219
Other liabilities and deferred credits:		
Frequent flyer deferred revenue	3,982	4,043
Pension liability	747	1,920
Postretirement benefit liability	671	1,000
Other financial liabilities	844	863
Other	1,369	1,284
Total other liabilities and deferred credits	7,613	9,110
Commitments and contingencies		
Stockholders' equity:		
Preferred stock	—	—
Common stock at par, \$0.01 par value; authorized 1,000,000,000 shares; outstanding 326,930,321 and 323,810,825 shares at December 31, 2022 and 2021, respectively	4	4
Additional capital invested	8,986	9,156
Stock held in treasury, at cost	(3,534)	(3,814)
Retained earnings	1,265	625
Accumulated other comprehensive income (loss)	175	(942)
Total stockholders' equity	6,896	5,029
Total liabilities and stockholders' equity	\$ 67,358	\$ 68,175

# United Airlines' Liabilities Structure

- Focus on 2022: short term liabilities are significant: AP is \$3,395M.
- Also note the special item: **“Advance ticket sales”** - it is \$7,555M!
- **Advance ticket sales** (also know as Air traffic liability) represents tickets sold for future travel dates (including estimated refunds) - effectively it is deferred revenue - it is a major source of funding!
- Using the definition of NWC as CA-CL United's NWC in 2022 is:  $\$20,058 - \$19,992 = -\$66$ . Working capital is close to zero!
- Using the operating working capital definition (adjusted for airlines):  $\text{Inventory} + \text{AR} - \text{AP} - \text{Advance ticket sales}$ :  
 $\$1,109 + \$1,801 - 3,395 - \$7,555 = -\$8,040$ !

- A measure of liquidity risk: how long the firm will need to wait for cash when increasing sales - time span between collection and disbursing of cash. How long is cash tied up in working capital.

$$CCC = DIO + DSO - DPO$$

- Calculation on annual basis:

$$\frac{INV}{COGS/365} + \frac{AR}{Sales/365} - \frac{AP}{COGS/365} = 365 \times \left( \frac{INV}{COGS} + \frac{AR}{Sales} - \frac{AP}{COGS} \right)$$

- Calculation on quarterly basis:

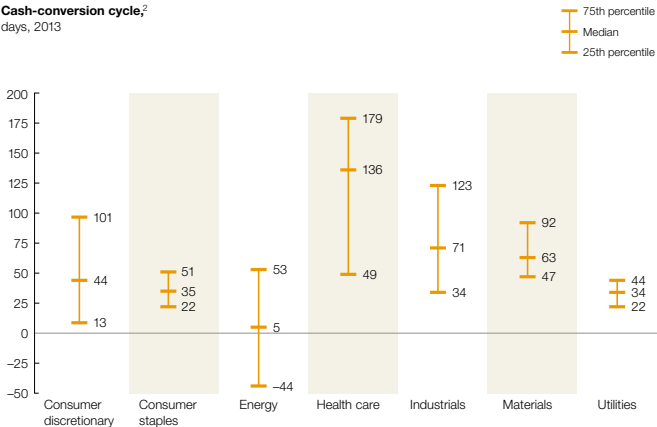
$$\frac{INV}{COGS/91.5} + \frac{AR}{Sales/91.5} - \frac{AP}{COGS/91.5} = 91.5 \times \left( \frac{INV}{COGS} + \frac{AR}{Sales} - \frac{AP}{COGS} \right)$$

- Managing working capital isn't the sexiest task.
- Yet, working capital can amount to as much as several months' worth of revenues.
- Improving working capital can be a quick way to free up cash.
- Recent examples include Alcoa which made working capital a priority in 2009 in response to the financial crisis.
  - By 2014, Alcoa was able to reduce its cash conversion cycle by 23 days and unlock \$1.4 billion in cash.
- This may be particularly important for distressed firms.

# Working Capital by Industry

**Needs of working capital differ by industry, but even within sectors performance varies widely.<sup>1</sup>**

**Cash-conversion cycle,<sup>2</sup>**  
days, 2013



● Source: McKinsey